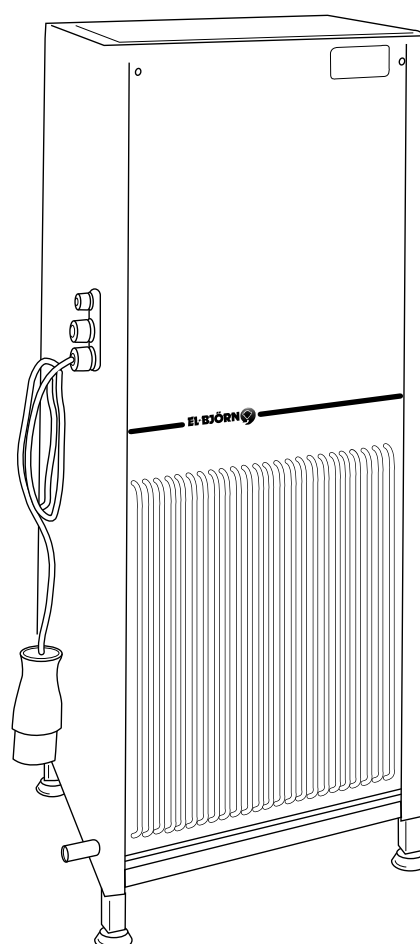


# Dehumidifier A 150VTI



EEA DECLARATION OF CONFORMITY



EG-försäkran om överensstämmelse  
EC/EEA Declaration of conformity

Här med försäkras att materialslag  
Herewith declares that the type of equipment  
Avfuktningsaggregat / Condensating dehumidifier

Typbeteckning/Modell nr  
Type designation(s)/Model no(s)  
A 150 F/R, A150 VTI

överensstämmer med bestämmelser i följande EG-direktiv  
is in conformity with the provisions of the following EC directive(s)  
93/68/EEG/CE-märkningsdirektivet  
73/23/EEG/Lågspänningsdirektivet  
89/336/EEG EMC direktivet


och att följande standarder och/eller tekniska specifikationer är tillämpade  
and that the following standards and/or technical specifications have been applied

Standard  
EN 60335-1:1994 och A1,A2,A11-A16  
EN60335-2-40:1997 och A1

Certifikat  
SEMKO 607415  
SEMKO 607415

Beträffande  
Elsäkerhet  
Elsäkerhet

Denna produkt är CE-märkt  
This product is CE-marked in  
2000

  
Bo Eriksson, Utvecklingschef  
Anderstorp 2006-02-09

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INTRODUCTION


Dehumidifier A 150VTI is designed for the careful drying of timber stacked in a chamber (container) with good circulation of air. This dehumidifier is not intended for drying impregnated wood.

Dehumidifier A 150VTI can be using for industry. This instruction manual gives a detailed description of how the dehumidifier should be used, cared for and inspected. It also describes the necessary measures required for maximum safety, how safety items are configured and how they work.

N.B. It is essential that the section dealing with safety is studied and understood by everyone using or repairing the dehumidifier.

The instruction manual deals with use of the dehumidifier and the maintenance items that can be attended to by the operator. More detailed service or trouble-shooting is to be done by service personnel authorized by the manufacturer. The instruction manual describes all necessary safety details and is to be studied and understood by the user before the dehumidifier is connected to the power supply. Ie, the first

thing to do on delivery is to find the instruction manual and read it.

 The symbols and warning signs illustrated on the next page are used on the dehumidifier and in this manual.

If any warning decals on the humidifier become worn or damaged they should be replaced by ordering new ones without delay so as to ensure the best possible safety in use.

This humidifier may only be used for the purposes described in these operating instructions.

The manufacturer reserves the right to make alterations.

TECHNICAL DATA

Technical data of the dehumidifier

Width:	470 mm	Working range, temp:	10-55°C
Height (incl. adjustable fot):	1267 mm	Working range, RH:	20-99%
Depth:	370 mm	Dehumidifying capacity:	max 5 l/h
		Air flow, free blowing:	1300m³/h
Weight:	69 kg	Refrigerant, type:	R134a
Power supply:	3N~400V	Refrigerant, quantity:	1000 g
Fuse:	10 A, slow	Pressure switch setting, low pressure:	2,0 bar, diff=1,5 bar
Rated power:	5400W	Pressure switch setting, high pressure:	23 bar
Power, heater battery:	3990W		

Data plate

Typ A 150VTI	Effekt:	5400 W	T.nr: 000444 E87 450 63 200904
400V / 3L+ N+ PE / 50Hz	Provtryck:	30 bar	
  IP44	Köldmedium:	R 134 a	
	Fyllnadsmängd:	1000g	
Box 29, 334 21 Anderstorp, Sweden, Tel+ 46(0)371- 58 81 00			

SAFETY RULES

Warning signs on the dehumidifier



Please study the instruction manual carefully and make sure you understand it before using the dehumidifier.



WARNING!  
400V

Warning for hazardous high tension if the cover is removed without first disconnecting the power supply.



The manufacturer’s guarantee that this product conforms to the requirements for safety according to the low voltage directives.



The air intake and output of the dehumidifier must never be blocked during operation.

Warning signs in these operating instructions



Please study the instruction manual carefully and make sure you understand it before using the dehumidifier.



Warning! The dehumidifier can be for hazardous. Careless or incorrect use can result in serious or fatal injury.



The manufacturer’s guarantee that this product conforms to the requirements for safety according to the low voltage directives.

Safety when connecting

Electrical connection of the dehumidifier and its peripheral equipment is to be made by an authorized electrician.

Safety in use

The air intake and outlet of the dehumidifier must never be blocked during operation. Protective covers and panels must never be removed during operation.

- This product is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the product by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the product.

Safety in maintenance

Power supply must be disconnected from the machine before any maintenance work is started on the dehumidifier. This is done either by unplugging the connector from the power socket or by switching off the main power switch.

All maintenance of the electrical system must be made by an authorized electrician.

All maintenance of the refrigeration system must be made by an authorized refrigeration mechanic.

To avoid injury, always wear gloves when cleaning the condenser or the evaporator.

Warnings and notices

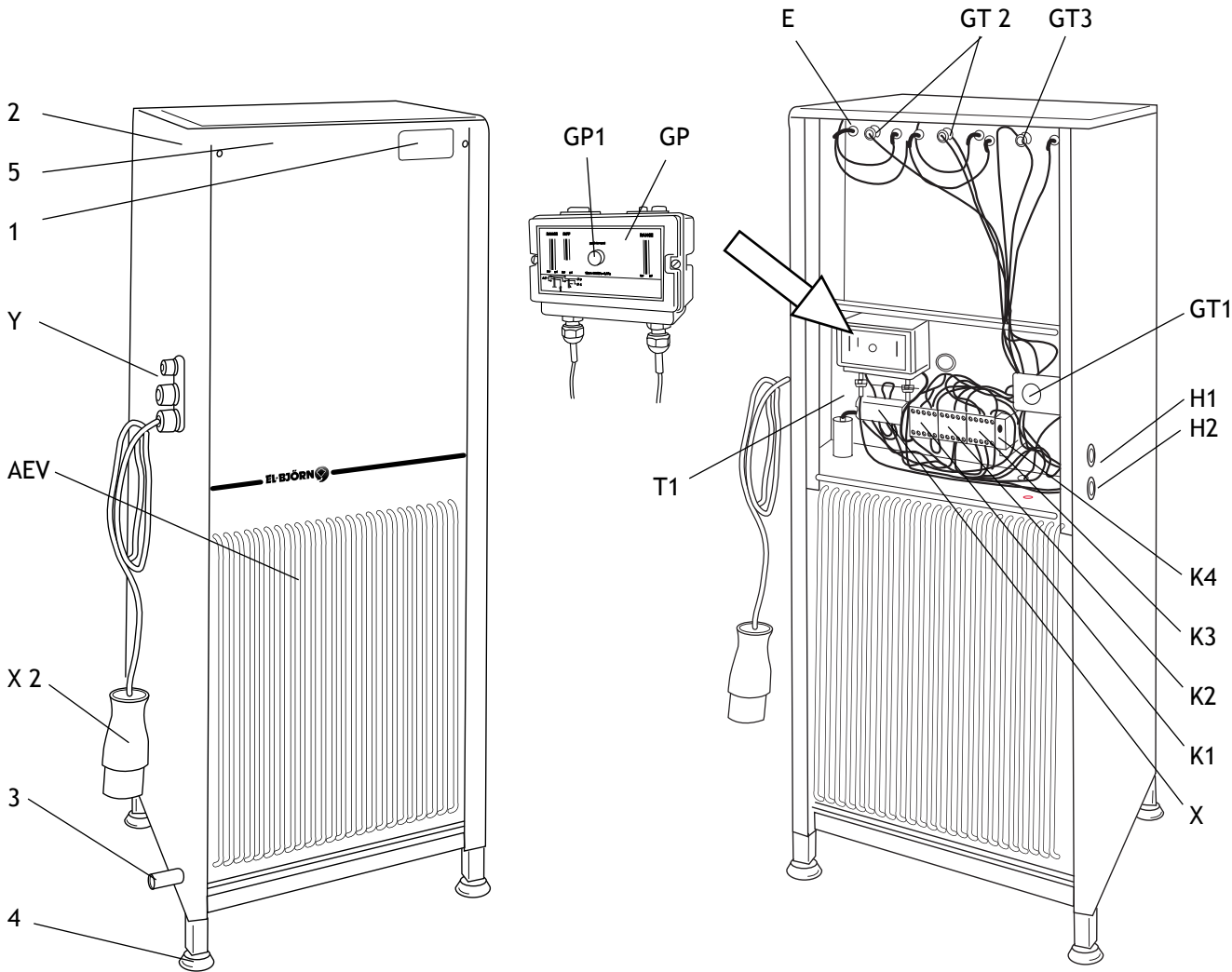
In the text below of this manual, please find suitable boxes to be marked.



**WARNING!**  
These boxes give warning for the danger of personal injury or material damage. The warning boxes are placed prior to the relevant procedure

**NOTE!** These boxes indicate measures to facilitate a particular procedure or to draw attention to special instructions.

DESCRIPTION



Description

- |     |  |    |                                  |
|-----|--|----|----------------------------------|
| 1   | Decal Warning  | K1 | Contactor for fan                |
| 2   | Data plate   | K2 | Contactor for compressor         |
| 3   | Water connection, Ø25 mm   | K3 | Contactor for heater battery     |
| 4   | Adjustable foot  | K4 | Time relay                       |
| 5   | Decal "May not be blocked"                                       | KD | Condenser. (See next page).      |
| AEV | Evaporator.  | M1 | Fan. (See next page).            |
| E   | Heater battery, 3990 W. (See next page).                         | M2 | Compressor (See next page).      |
| FT  | Filterdrier. (See next page).                                    | X  | Terminal block                   |
| GP  | Pressure switch, double  | X2 | Connector. 5-pole, 16 A.         |
| GP1 | Manual resetting of high-pressure contact on the pressure switch | SD | Expansion valve (See next page). |
| GT1 | Thermostat for regulation of heater battery                      | Y  | Cableconnection (x3)             |
| GT2 | Thermal protection, manual reset. (x2).                          | T1 | Timer                            |
| GT3 | Thermal protection, automatic reset.                             |    |                                  |
| GT4 | Thermal protection in fan. (Not visible).                        |    |                                  |
| H1  | Control lamp for high pressure, red                              |    |                                  |
| H2  | Control lamp for low pressure, red                               |    |                                  |

# DESCRIPTION

## Function

### Dehumidifier A 150 VTI

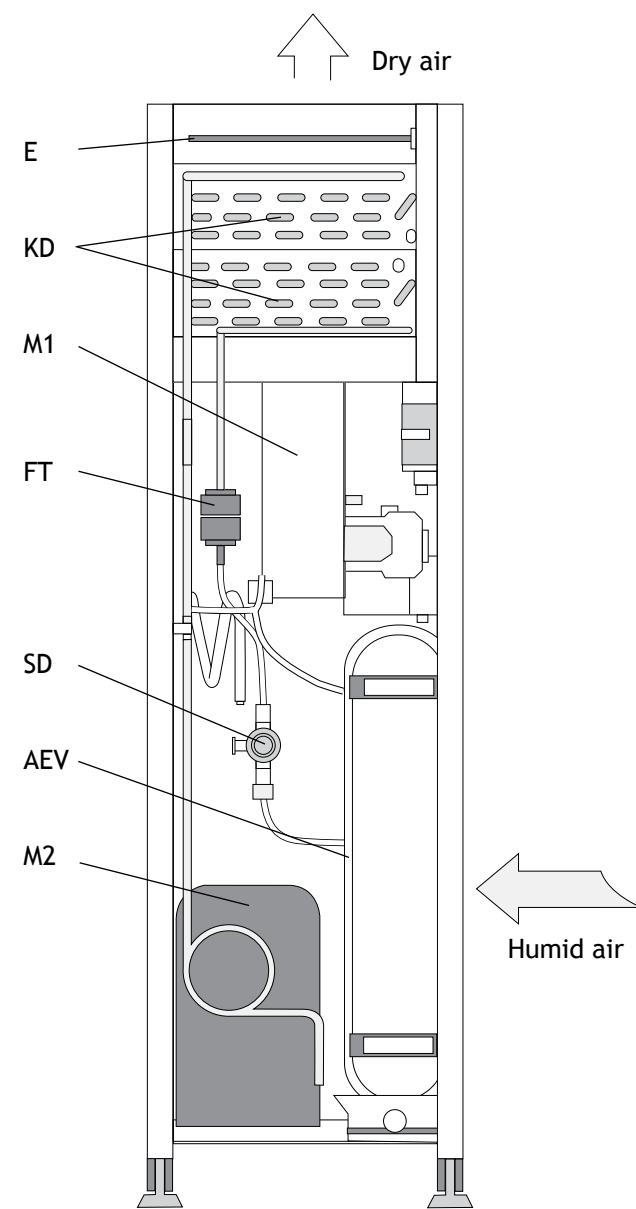
The A 150VTI is a condensing dehumidifier, ie, based on the principle that moisture in the air condenses on cold surfaces.

The cold surfaces are created on the evaporator (AEV) by the compressor (M2) transmitting heat from the evaporator to the condenser (KD).

The unit is fitted with a fan (M1) which forces air through the dehumidifier.

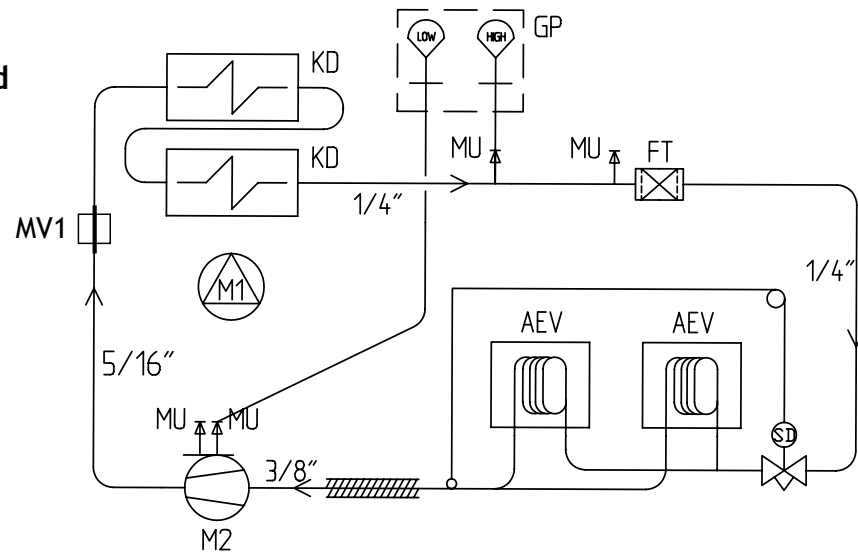
The air passes first through the evaporator (AEV) where moisture is condensed and collects on the evaporator.

The water runs down into a container underneath the evaporator and is drained off. After this, the air continues through the fan (M1) and the condenser (KD). The air is heated in the condenser at the same time as the condenser is cooled. The air can then be heated if necessary in the heater battery (E) before leaving the dehumidifier.



### Flow diagram for evaporated refrigerant Components

AEV	Evaporator
E	Heater battery
FT	Dryer filter
GP	Pressure switch, double
KD	Condenser
M1	Fan
M2	Compressor
MU	Test point
SD	Expansion valve



# DESCRIPTION

## Electrical system

### Function

In the circuit diagram, terminal 8 and 9 and also terminal 5 and 6 are strapped. An external thermostat and humidistat can be connected to these terminals. This is described under “Installation“. The description below, however, refers to a machine without these components.

The following occurs as the control system becomes energized:

1. The Contactor (K1) activates and starts the fan (M1) and the heater battery (E).
2. K2 activates via K1 and K4 and starts the compressor (M2).
3. When the temperature has risen to setpoint value GT1 cuts off the power to the heater battery (E).
4. The temperature regulates with the thermostaten (GT1), which switches the heater battery (E) on according to setpoint value.
5. When the temperature in the evaporator decreases there is a risk for iceing. If ice is produced GP (defrost) cuts off the power to K4 and the compressor stops.
6. When the pressure switch GP and time relay K4 switch on the dehumidifier start.

### Industry-dehumidifier

In condition as an industry-dehumidifier you will adjust/ customize the low pressure level. The time relay is used in this conditions as defrost time and is depend on surroundings (see time relay) .

### Control lamp for high pressure (H1)

f it becomes too warm during operation, the pressure in the condenser will rise and the high-pressure contacts in the pressure switch (GP) will switch over. The control lamp for high pressure (H1) will light and the compressor (M2) stops. GP is reset with GP1.

### Control lamp for low pressure (H2)

- H2 lights when the following prerequisites are fulfilled:
- Low pressure in the evaporator is below the set value. (2,0 bar,  $\Delta p=1,5$  bar).

### Fan (M1)

The fan motor does not have an individual motor protector switch but is fitted with a thermocontact (GT4). The thermocontact is fitted inside the motor winding and cuts off the current if the temperature becomes too high. The thermocontact resets automatically when the temperature falls.

The fan need a capacitor to work correct.

Compressor (M2)

The compressor does not have an individual motor protector switch. The motor protection function is integrated with the motor winding and stops the motor if the temperature becomes too high. The function resets automatically when the temperature falls.

### Compressor (M2)

The compressor does not have an individual motor protector switch. The motor protection function is integrated with the motor winding and stops the motor if the temperature becomes too high. The function resets automatically when the temperature falls.

### Time relay (K4)

The funktion is to delay start.

The time relay is used on different way as wood-dehumidifier or industry-dehumidifier (See part ”pressure switch” below and part ”time relay” page 14).

### Thermostat (GT1)

GT1 controls the heater battery (E) and is adjustable between 0-40 °C.

### Overheating protection (GT2:1 and GT2:2)

GT2:1 and GT2:2 are two thermocontacts located in the heater battery (E). GT2:1 and GT2:2 cut off the current at 90 °C and have to be reseted by hand when the temperature has fallen.

### Overheating protection (GT3)

GT3 is a thermocontact also located in the heater battery and cuts off the power to K3 at 70 °C. GT3 resets automatically when the temperature has fallen.

### Pressure switch (GP)

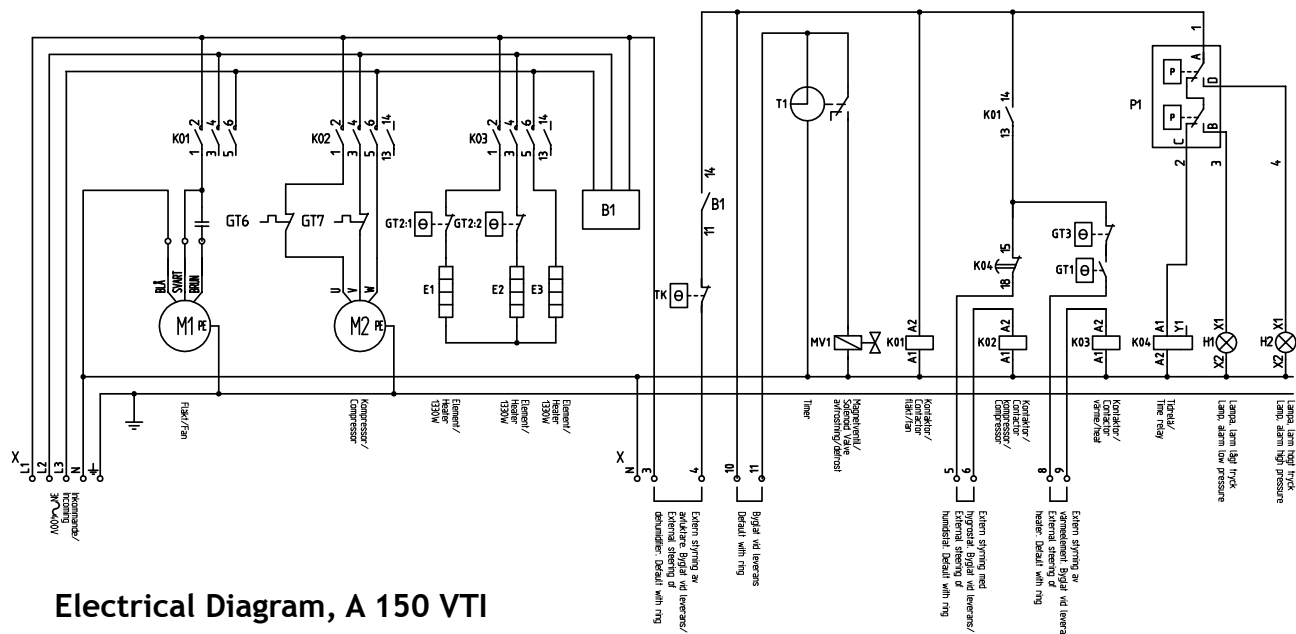
Wood-dehumidifier/industry-dehumidifier

GP is a double pressure switch, ie, for both low and high pressure.

The low pressure contact starts the compressor when pressure in the evaporator reaches 2.0 bar and stops at 0.5 bar. The high-pressure contact stops the compressor when pressure in the condenser rises above 23 bar.

The high-pressure contact is reset by hand with GP1.

# ELECTRICAL DIAGRAM



Electrical Diagram, A 150 VTI

Components:

- B1 Phase-rotation relay
- E1-3 Electric heater, 3x1330W
- GT1 Thermostat 0-40°C
- GT2:1, GT2:2 Thermal protection, manual reset.
- GT3 Thermal protection, automatic reset.
- GT4 Thermal protection in fan (not visible)
- GT6 Overload/Internal thermostat
- GT7 Overload/Internal thermostat
- K01 Contactor, fan
- K02 Contactor, compressor
- K03 Contactor, heater battery
- K04 Time relay
- M1 Fan
- M2 Compressor
- X Terminal block
- P1 Pressure switch, double
- TK Thermocontact in compressor. Automatic reset.
- T1 Timer
- MV1 Solenoid valve

Terminal block X:

External steering of dehumidifier is connected between 3 and 4 in terminal block X.  
Remove the ring between 3 and 4 when external steering is connected.

External steering of humidistat is connected between 5 and 6 in terminal block X.  
Remove the ring between 5 and 6 when external steering is connected.

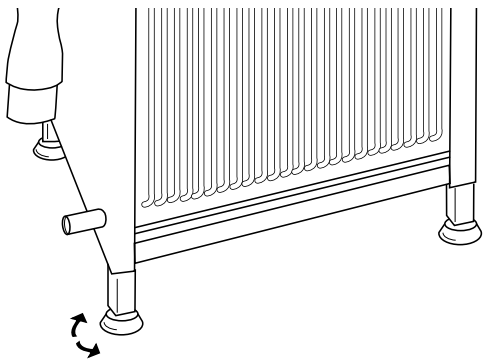
External steering of heater battery is connected between 8 and 9 in terminal block X.  
Remove the ring between 8 and 9 when external steering is connected.

Disconnection of hot gas defrost. Remove the ring between 10 and 11.

# INSTALLATION

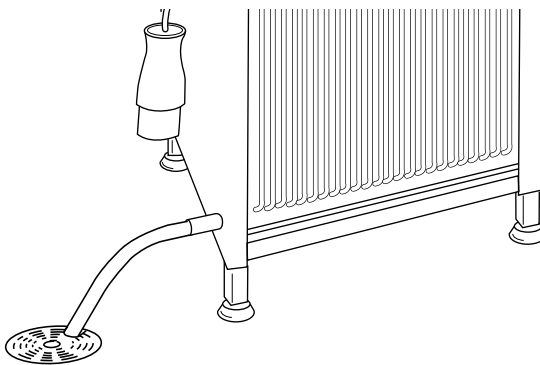
Location

The dehumidifier should be placed on a flat and firm base.  
Set the adjustable feet so that the dehumidifier stands level.



Drain

The dehumidifier is fitted with a 25 mm pipe muff for a drain hose. Connect a suitable piece of hose and lead it so that any water runs into a floor drain for example.

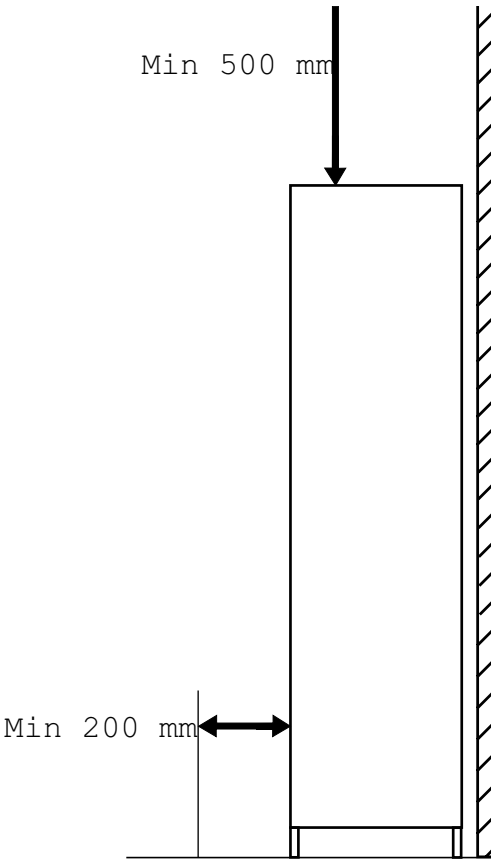


Air circulation

The dehumidifier should suitably be placed with its back facing a wall inside the drying chamber.  
Free space in front should be at least 200 mm.  
Free space above should be at least 500 mm.

External fans

If there are other fans for air circulation in the drying chamber they must not be allowed to blow direct on the air intake or output of the dehumidifier.





# INSTALLATION

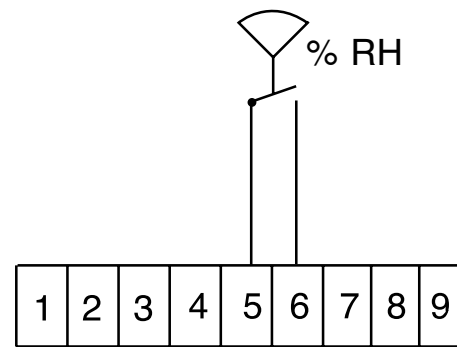
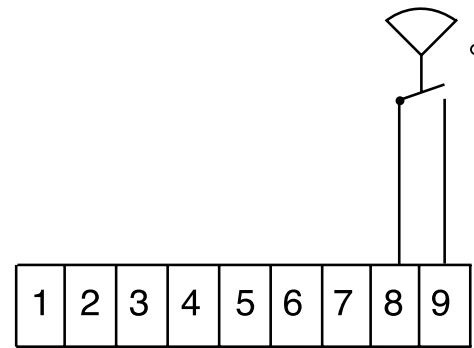
## Electrical connection

The dehumidifier can be provided with external control. This can be desirable in the following circumstances:

- If several dehumidifiers are to be regulated together using a common control system.
- If control is required using a thermostat other than the one in the dehumidifier.
- If the dehumidifier is to stop at a certain degree of humidity.

## External temperature control (°C)

1. Remove the strap between terminal 3 and 4 in the terminal block X1.
2. Connect the thermostat to terminal 3 and 4. Use cable with a cross-sectional area of at least 0.75 mm<sup>2</sup>.
3. Set the internal thermostat GT3 in the dehumidifier to maximum.
4. The heater battery is in operation only when the dehumidifier works.



## External humidistat (%RH) for automatic stopping

An external humidistat regulates the solenoid valve Y only, which in turn regulates the compressor via the pressure switch. Connect the humidistat as follows:

1. Remove the strap between terminal 5 and 6 in the terminal block X1.
2. Connect the humidistat to terminal 5 and 6. Use cable with a cross-sectional area of at least 0.75 mm<sup>2</sup>.
3. The dehumidifier is in operation with closed humidistat contacts.

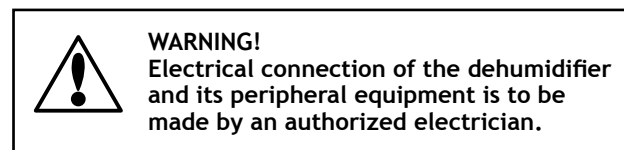
## Simultaneous operation of several dehumidifiers

To control several dehumidifiers at the same time the appropriate pair of terminals should be connected to an external contactor. The control coil of the contactor is to be connected to the respective sensor.

## Electrical supply

Connect the dehumidifier via a main switch to 3N~400 V and earth. The mains shall be fused with 10 A slow blow fuse. Connect to terminal (X).

The phase-sequence relay is activated only if the dehumidifier is correct connected. If the dehumidifier not start, switch two phases.



# INSTALLATION

## Container drying

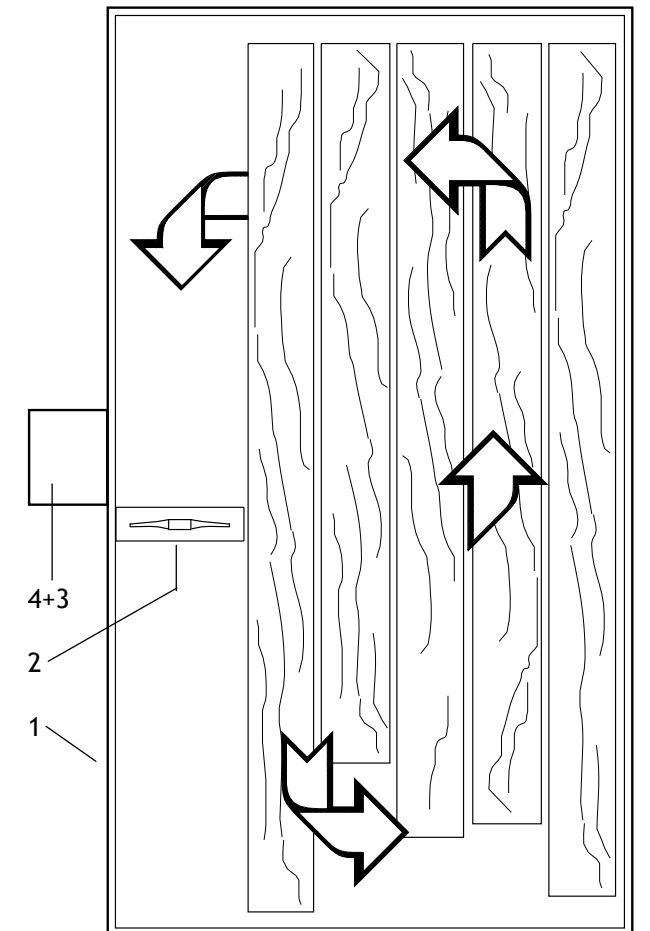
Container drying is used mainly for the drying of timber.

An example of how the dehumidifier can be connected to a container is illustrated below.

Place the dehumidifier inside the container. Make a hole in the container for connection to the air intake of the dehumidifier.

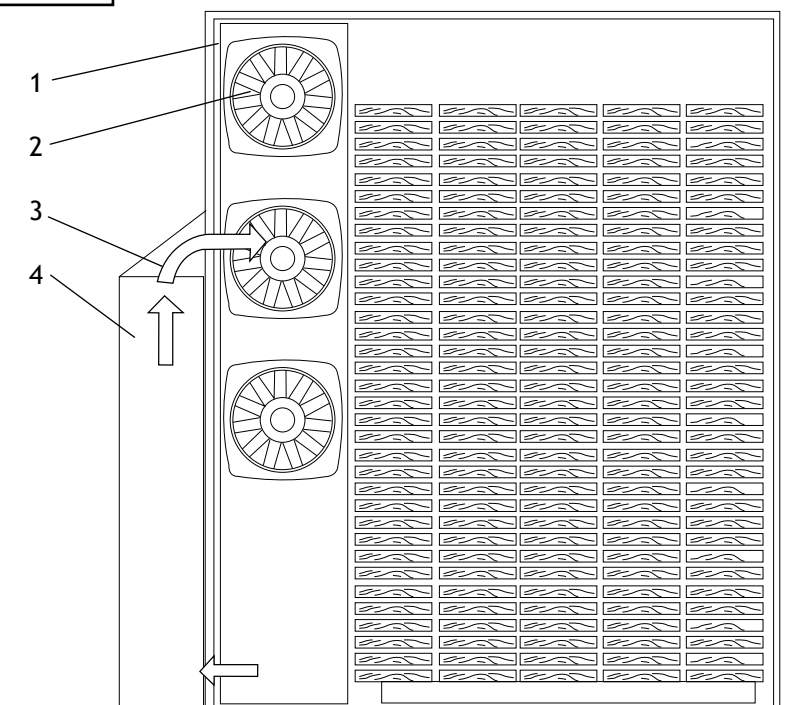
The dry air from the dehumidifier is led back into the container with the aid of a hood or duct elbow. The container is provided with fans to ensure circulation of the air. To improve results, the fans can be reversed after a set time so that the flow of air inside the container changes direction.

1. Container (Not included in the delivery)
2. Axial fans (Not included in the delivery)
3. Hood (Not included in the delivery)
4. Dehumidifier A 150VTI



### NOTE!

Only the dehumidifier shown in this example is included in delivery. All other items, such as container, hood and axial fans, are not supplied by El-Björn AB.



DRYING

Drying



**WARNING!**  
The air intake and output on the dehumidifier must never be blocked during operation.

Protective covers and panels must never be removed during operation.

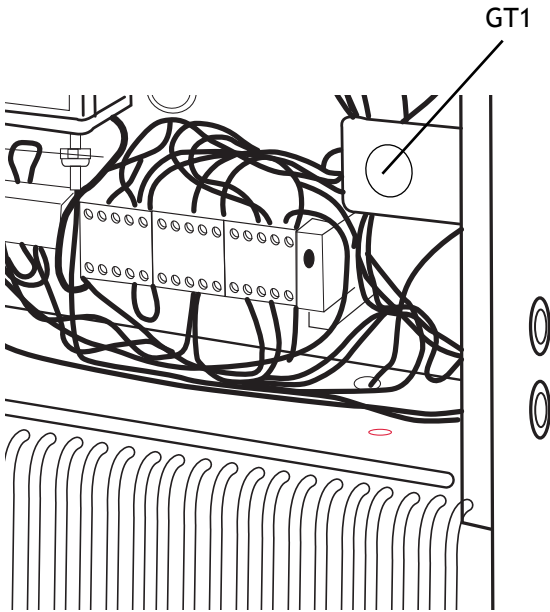
Without external control

For drying with minimal power consumption, set the heater battery thermostat (GT1) at about 40°C. Plug in the dehumidifier to a power socket and make sure that the main switch is turned on.

NOTE!

When connecting the dehumidifier to the electrical system it may sometimes happen that the compressor will start and run for a short while before the starting temperature has been reached. It will, however, stop as soon as pressure in the evaporator has evened out.

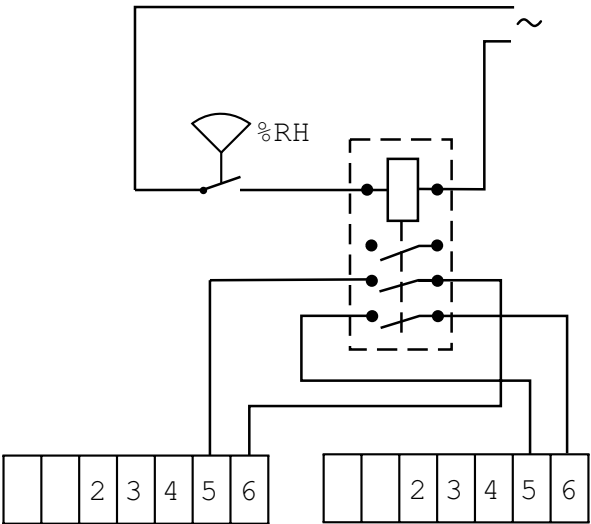
If the heater battery (E) has an external thermostat, set the dehumidifier's internal thermostat (GT1) on maximum temperature.  
Plug the dehumidifier to a socket and make sure that the circuit breaker is turned on.  
Also, see the instructions for the external steering.



**ATTENTION!**  
The figure to the right shows only parallel operation with automatic stop for two dehumidifiers.



**WARNING!**  
Electrical connections of the dehumidifier and its peripherals must be performed by a qualified electrician in accordance with national wiring regulations.



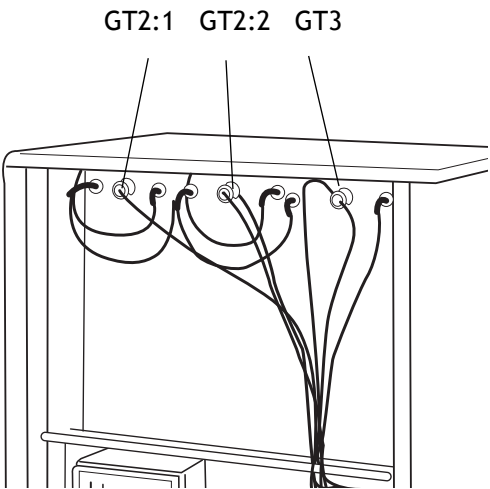
MAINTENANCE

Operation malfunction

The dehumidifier is provided with manual resetting protection for the heater battery and high pressure and with a fuse for the electrical control system.

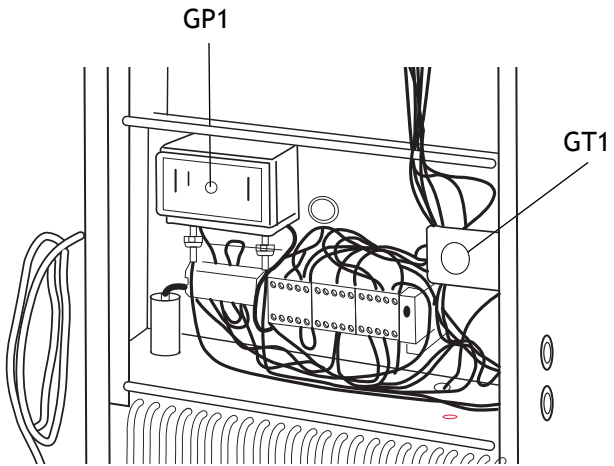
If the heater battery stops working during operation it will probably be due to tripping of the overheating protector (GT2). Reset the protector as follows:

1. Disconnect power supply to the dehumidifier.
2. Check why the protector has tripped and take any necessary corrective action. The cause can be insufficient circulation of air or temporary loss of power when starting.
3. Remove the top-cover and the front-covers.
4. Press sprung-contacts on GT2:1 and GT2:2.
5. Refit the covers and start the dehumidifier.



If the compressor stops and the high-pressure lamp (H1) lights then the high-pressure protection of the pressure switch (GP1) has tripped. Reset the protector as follows:

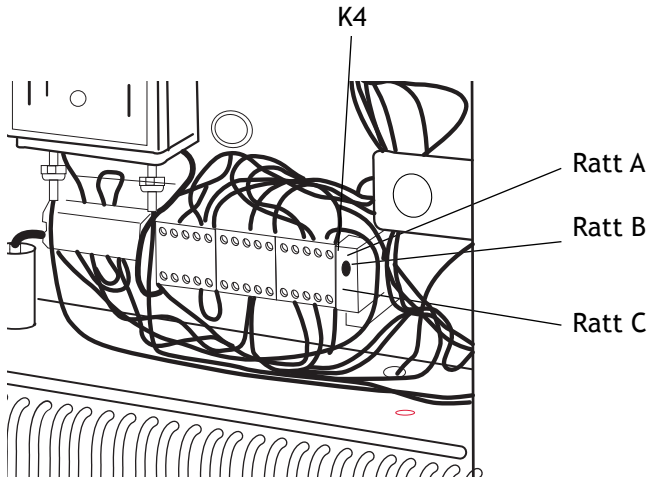
1. Disconnect power supply to the dehumidifier.
2. Screw off the cover on the right-hand side.
3. Press the blue knob GP1.
4. Refit the cover and start the dehumidifier.



Sequence relay (K4)

**Wood-dehumidifier**  
When using the dehumidifier as wood-dryer the function is to delay the start and reduce the start up power when several dehumidifiers are used.

**Industrial-dehumidifier**  
When using the dehumidifier as industrial-dryer the function is to delay the start and create time for defrost (approx. 5 minutes) when the dehumidifier is in lowpressure condition.



Adjust the time relaying control wheel

Utilize	Wheel A	Wheel B	Wheel C
Wood dryer	ex. 1-10 min.	≥ 0 min	pos A
Industrial dryer	ex. 1-10 min alt. ex.6-60 min.	≥ 5 min	pos A

## MAINTENANCE



**WARNING!**  
Power must be disconnected before starting any maintenance work on the dehumidifier.  
This should be done by unplugging the power supply or by turning off the main switch.

All maintenance of the electrical system must be preformed by an authorized electrician.

All maintenance of the refrigeration system must be preformed by an authorized refrigeration mechanic.

### Every sixth month

Check that the dehumidifier is clean inside, every sixth month.



**WARNING!**  
Always use gloves when touching the condensor and the evaporator.  
There is a risk for cuts from the sharp lamellas.

Preform the following maintenance when necessary:

- Change the filter cassette 1–2 times per year.
- Wash the evaporator's (AEV) lamellas with mild detergent and water when necessary.



**WARNING!**  
Never direct the pressure jet directly on to the condenser fins. They may otherwise be damaged by the jet.

### Repairs

If severe problems would arise please contact your nerest dealer of this product or in second hand the manufacturer.

Manufacturer: El-Björn AB

Tel. +46 (0)371 - 58 81 00

E-mail: [info@elbjorn.se](mailto:info@elbjorn.se)

### Every year

Check the following items annually.  
The items must be checked by qualified personnel.

- Cleaning of the evaporator.
- Cleaning of collection vessel and outlet.
- Check the bearings in fan. Check the tightening of the assembly fitting that holds the impeller of the fan. Check all other tightenings.
- Check the refrigeration system and preform a leaktest.
- Check the electrical system.

## SPARE PARTS

Always state the following when ordering parts:

- Type
- Serial number

This data is located on the data plate on the dehumidifier.

Item indicates the location of the spare parts in the figures.

Page indicates the page that includes the figure.

Qty. ie. quantity, indicates the number of such parts that are included in the dehumidifier.

Item	Page	Designation	Qty	Article number
4	5,9	Adjustable foot	4	KL502520
1	5	Decal "Warning 400V"	1	KL604236
2	5	Data plate	1	KL599005
5	5	Decal "Do not block"	1	KL604235
Y	5	Cableconnection M25	2	1477684
Y	5	Nut for cableconnection M25	2	1477633
Y	5	Cableconnection M16	1	1477682
Y	5	Nut for cableconnection M16	1	1477631
AEV	5,6	Evaporator	1	KLA400650
SD	6	Expansions valve	1	KL403070
		Dysa	1	KL403071
E	6,7	Electric heater, 1330 W	3	KL305040
FT	7	Drier filter	1	KL401320
GT1	5,7	Thermostat 0-50 °C.	1	KL304111
GT2: 1,2	5,7	Overheating protection	2	KL304236
GT3	5,7	Overheating protection	1	KL304235
B1	7	Phase sequence/failure relay	1	KL301008
K1-K3	5	Contactor	3	3230604
KD	6	Condensor	2	KL400152
K4	5,7,13	Time relay MER 1	1	KL301407
M1	6	Fan	1	KL300103
		Capacitor 5 uF (for fan)	1	KL300102
M2	6	Compressor	1	KL410110
X	5	Terminal block, white/gray	10	2916204
X	5	Terminal block, blue	3	2916205
X	5	Terminal block, yellow/green	2	2916280
X2	5	Connector 5-pol 16A	1	1960033
H1-H2	5	Control lamp red round	2	KL302202
T1	5,8	Timer	1	KL301502
MV1	8	Solenoid valve	1	KL403200



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